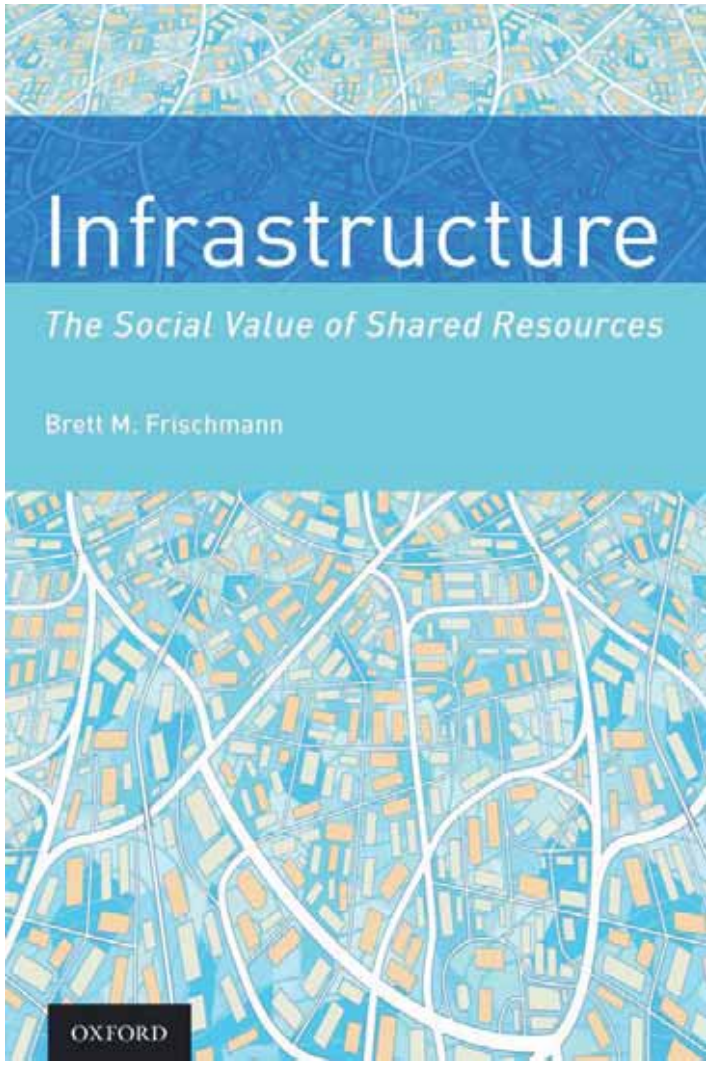
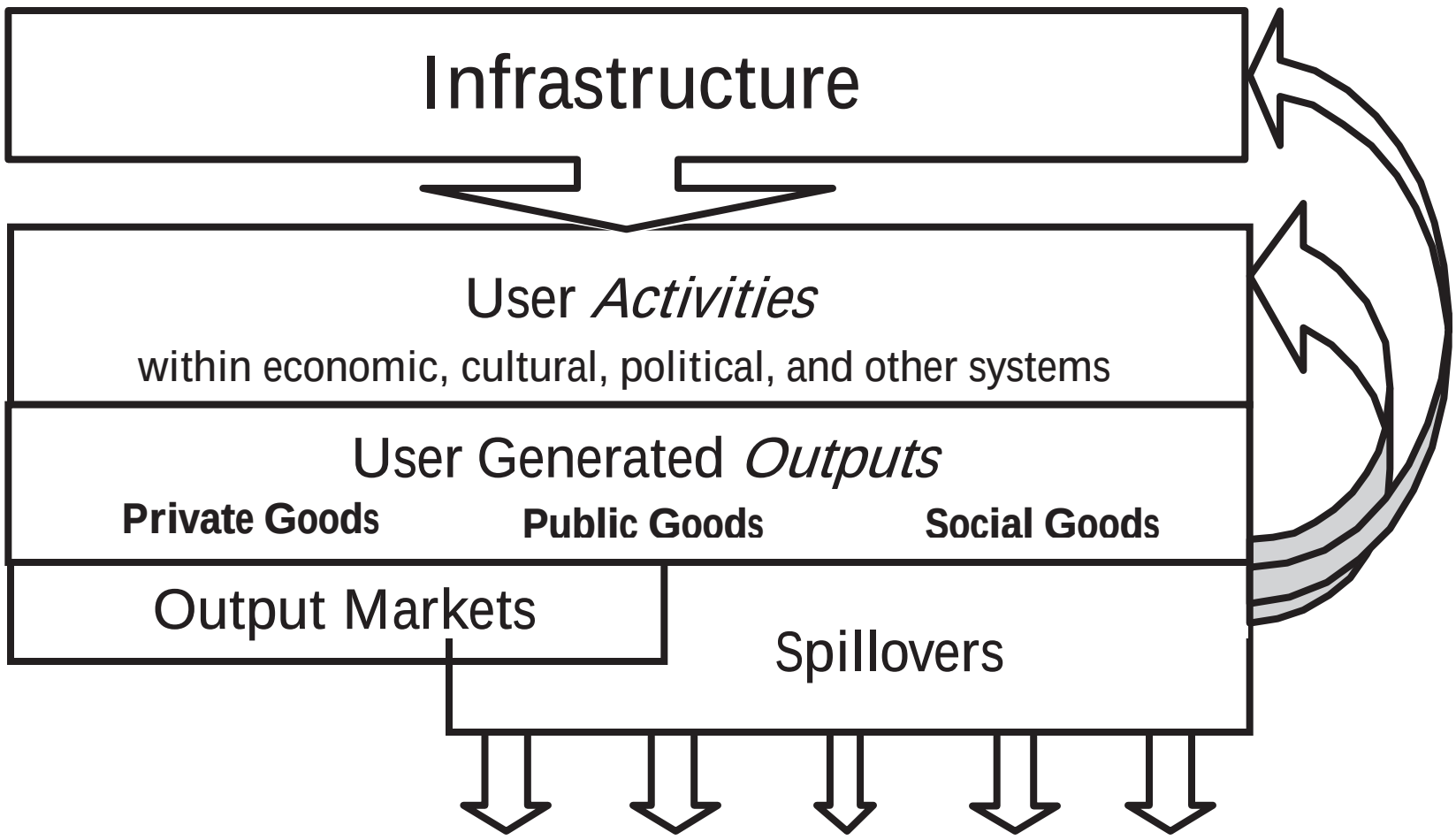


Brett M. Frischmann

***Professor of Law,* Cardozo Law School**

Project

- Approaching the economics of foundational resources from the demand side
  - Where does the value come from?
- Interdisciplinary
  - law and economics
  - many disciplines within law
  - many disciplines within economics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within economic, cultural, political, and other systems
User Generated *Outputs*
Private Goods
Public Goods
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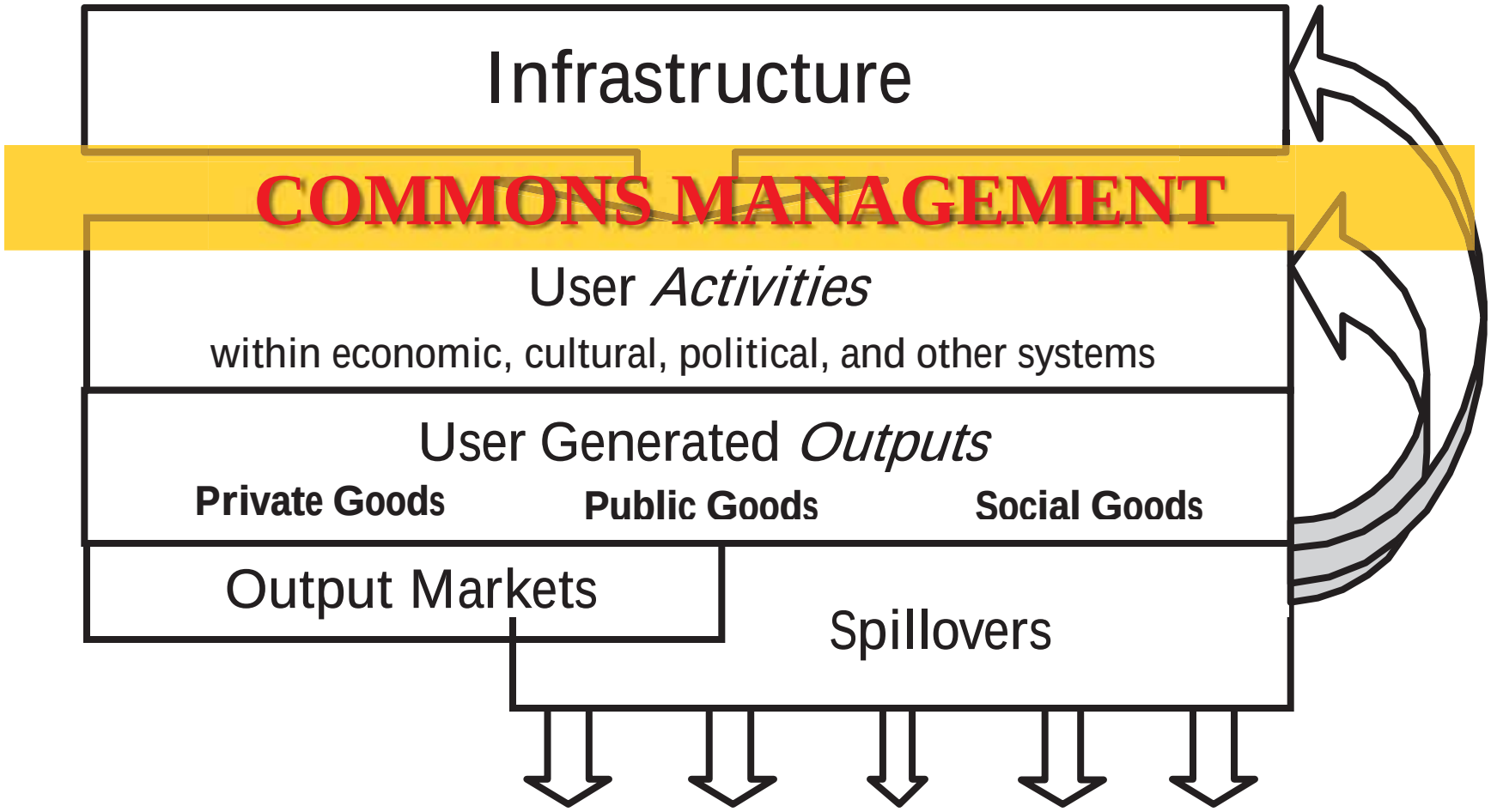
Output Markets
Spillovers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Infrastructural Resources

1. The resource may be consumed nonrivalrously;

2. social demand for the resource is driven primarily by downstream productive activity that requires the resource as an input; and

3. the resource is used as an input into a wide range of goods and services, including private goods, public goods and/or social goods.

		Capacity	Type of Good
(Non)Rivalrousness of Consumption	Nonrival	• Infinite • Sharable • Not congestible	Pure public good (idea)
	Partially (non)rival	• Finite • Potentially renewable • Potentially sharable • Congestible • Depreciable	Impure public good (lake, road, the Internet)
	Rival	• Finite • Nonrenewable • Not sharable	Private good (apple)

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		Demand	
		Consumption	Derived
(NON)RIVALROUSNESS OF CONSUMPTION	Nonrival or Partially (Non)rival	Public consumption good	Public capital good
	Rival	Private consumption good	Private intermediate good or raw material

Infrastructural Resources

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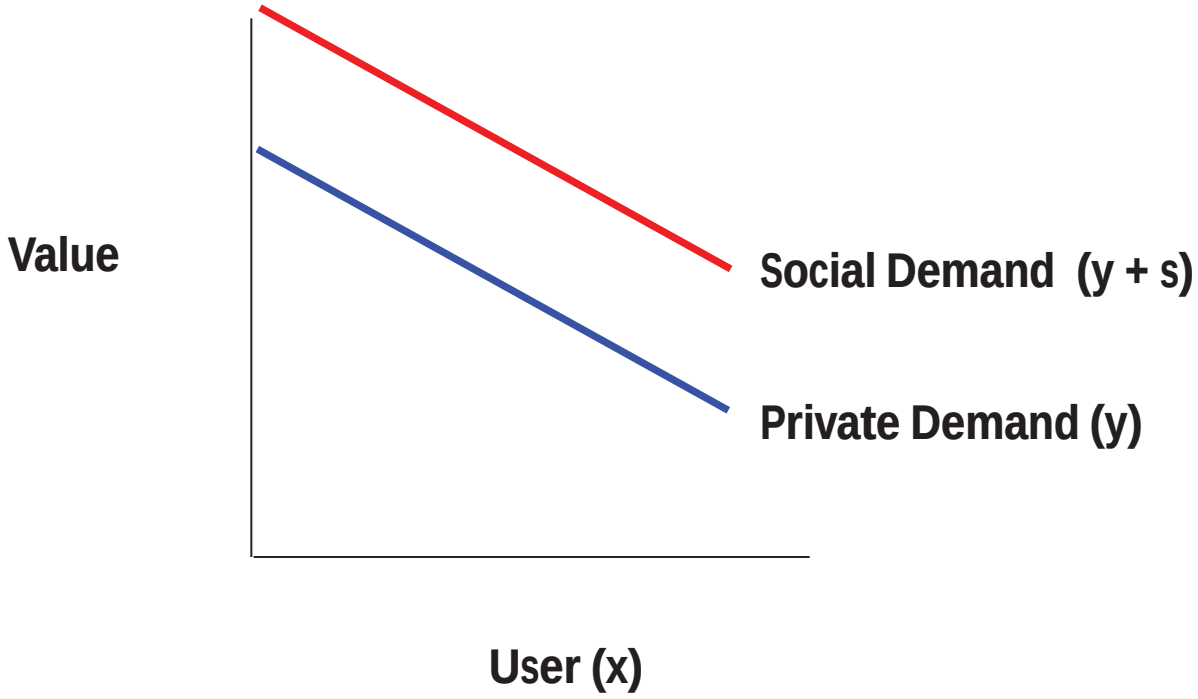
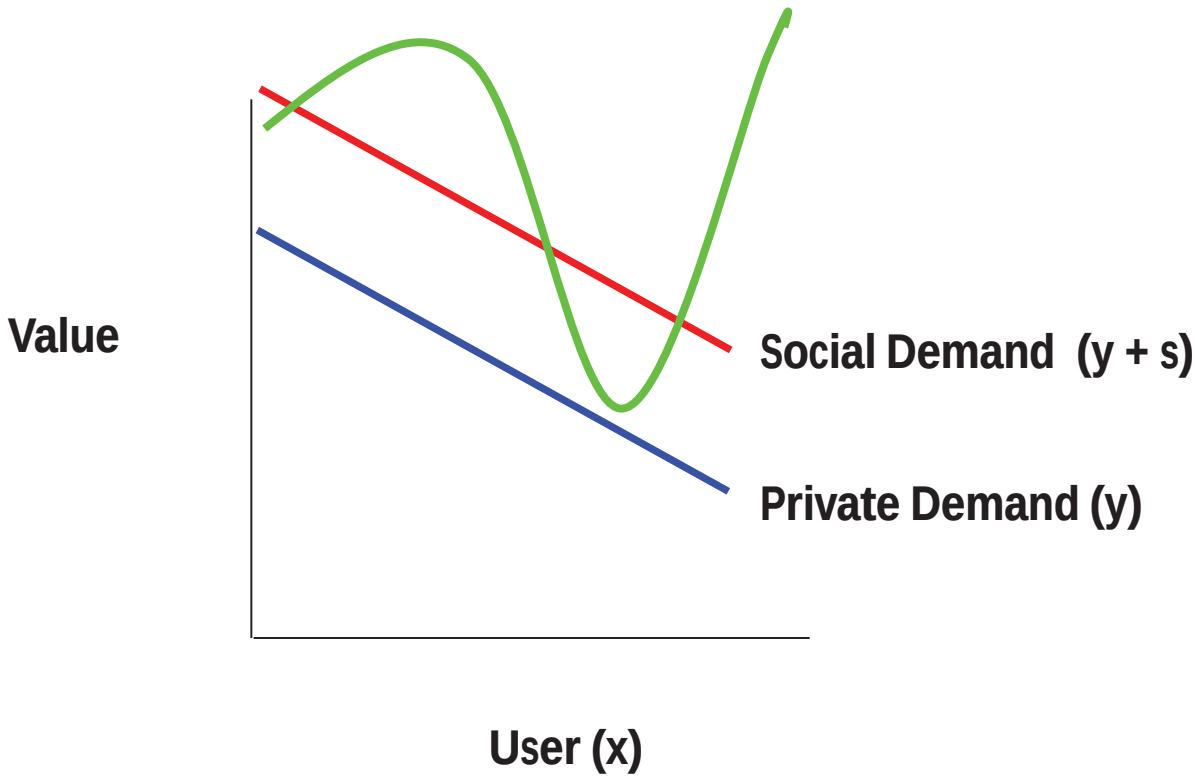
- Infrastructure enable many systems (markets and non-markets) to function and satisfy demand derived from many different types of users.

- Infrastructure are *not* special purpose resources, optimized for a particular user or use to satisfy the demand derived from a particular downstream market or set of markets.

- Infrastructure provide basic, multi-purpose functionality.


Value
Social Demand (y + s)
Private Demand (y)
User (x)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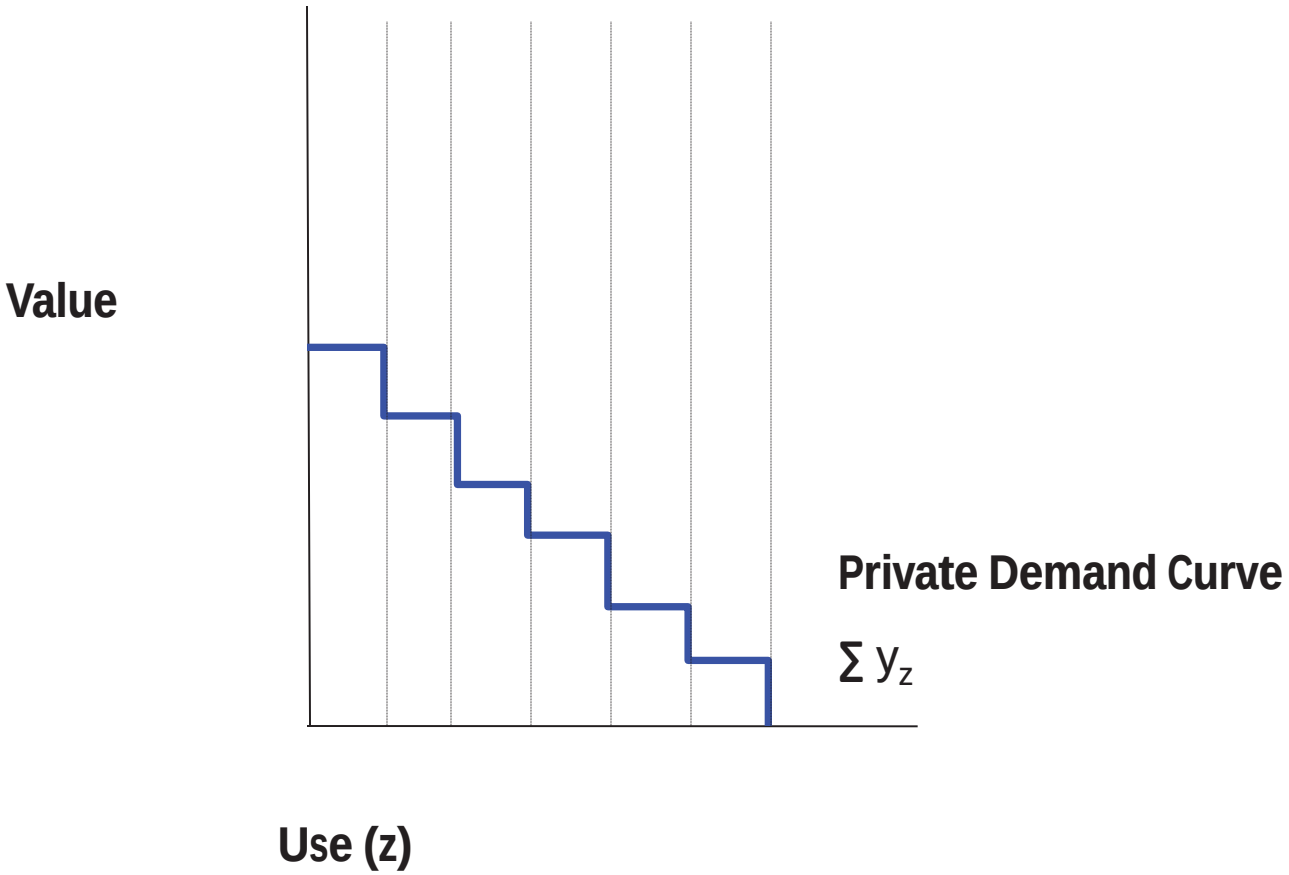
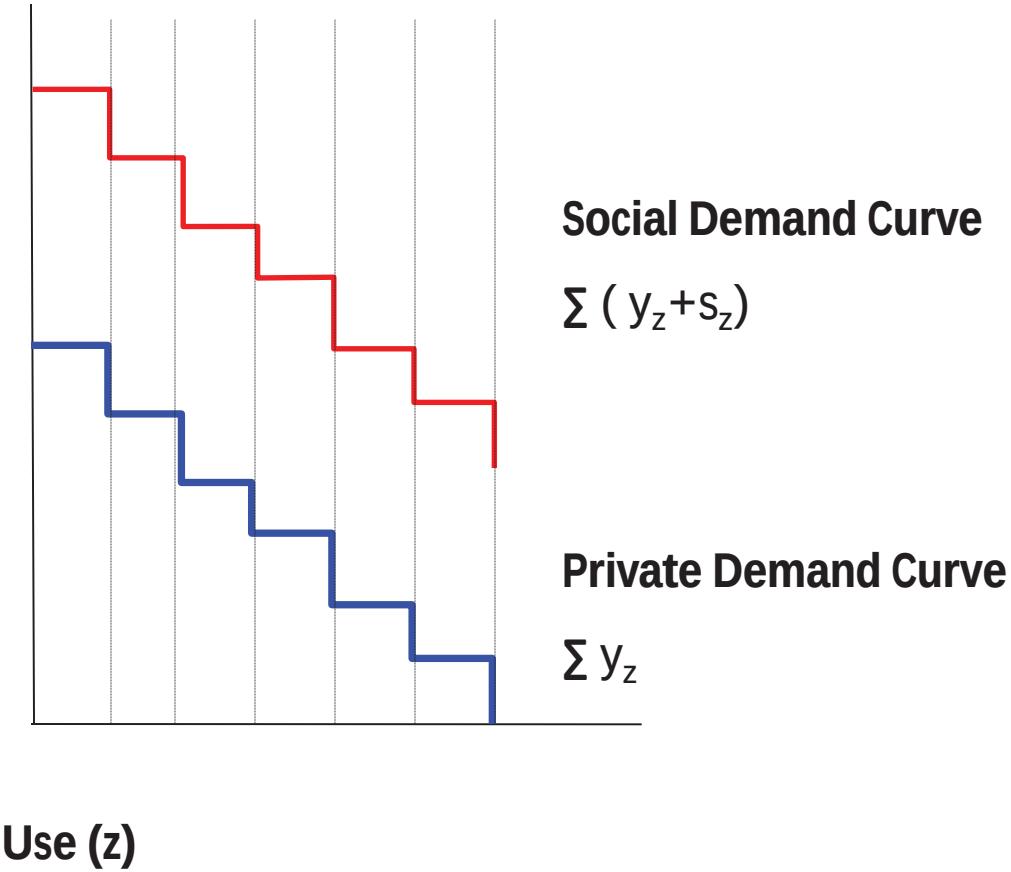


Uses z1, z2, z3, … ranked according to aggregated willingness to pay.



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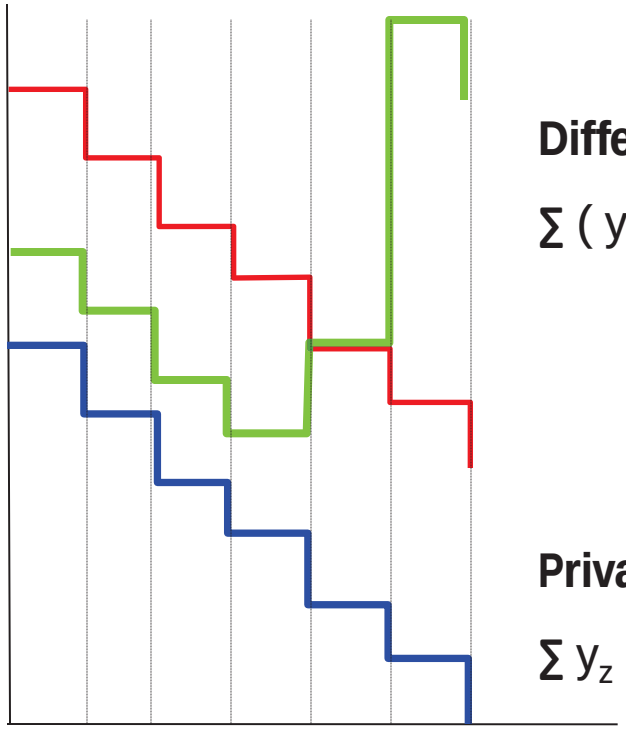

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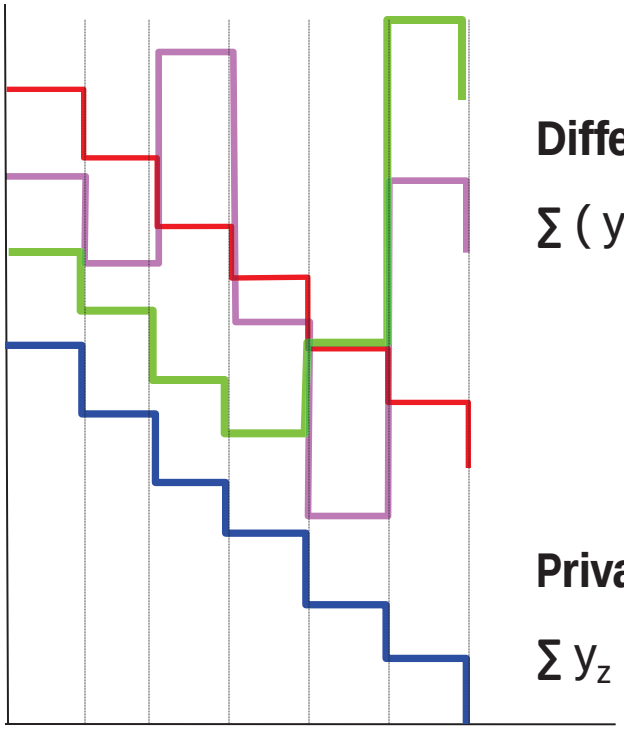


Different Social Demand Curves

$\sum (y_z + s_z)$

Private Demand Curve

$\sum y_z$

Use (z)

Note: Uses z1, z2, z3, … ranked according to aggregated willingness to pay.

YouTube

Matthew's Birthday Party Video:

http://www.youtube.com/watch?v=2PcxxiDvgRc

stats:

168 views

0 likes, 0 dislikes

0 comments

Intended audience? Maybe 25?

Charlie bit my finger -- again! Video:

http://www.youtube.com/watch?v=_OBlgSz8sSM

stats:

469,739,454 views

934,803 likes, 131,326 dislikes

754,333 comments

Intended audience? 1? Maybe 25?

YouTube

***Matthew's Birthday Party* Video:**

http://www.youtube.com/watch?v=2PcxxiDvgRc

Small scale spillovers add up when activity is widespread.

0 comments

Intended audience? Ma

Charlie bit my finger -- ag

http://www.youtube.com/watc

stats:

469,739,454 vie

934,803 likes, 131,32

754,333 comme

Intended audience? 1? M

Substantial spillovers from a single video.

Ma

http://ww

Small scale **en activity is widespre**

Charl

http://ww **tial**

934,803 likes, 131,32 **s from a**

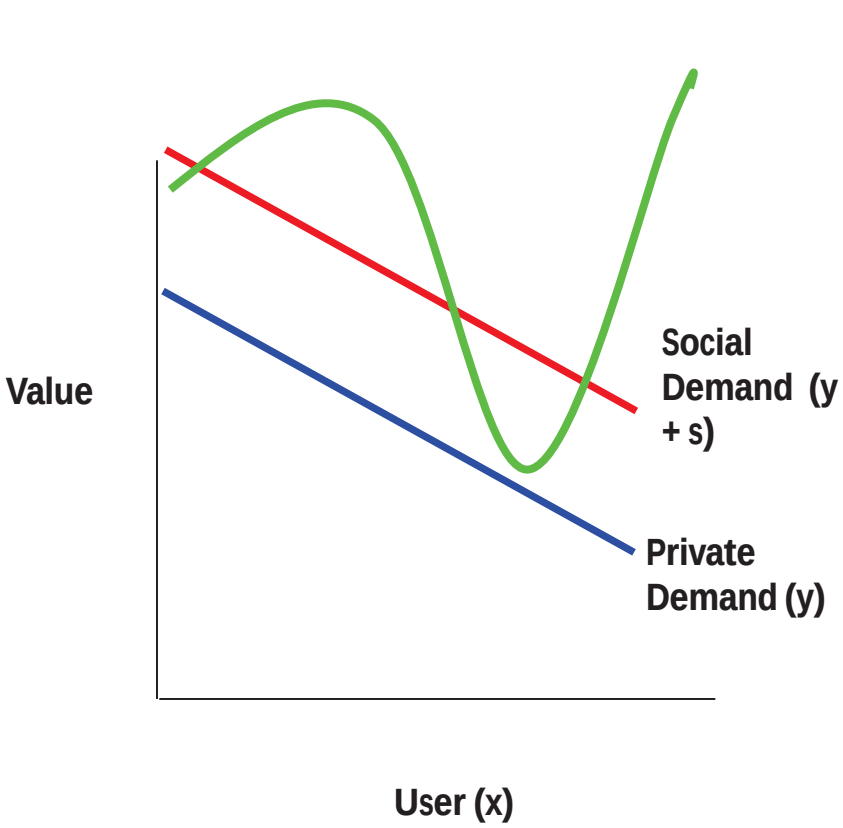
754,333 comme **single video.**

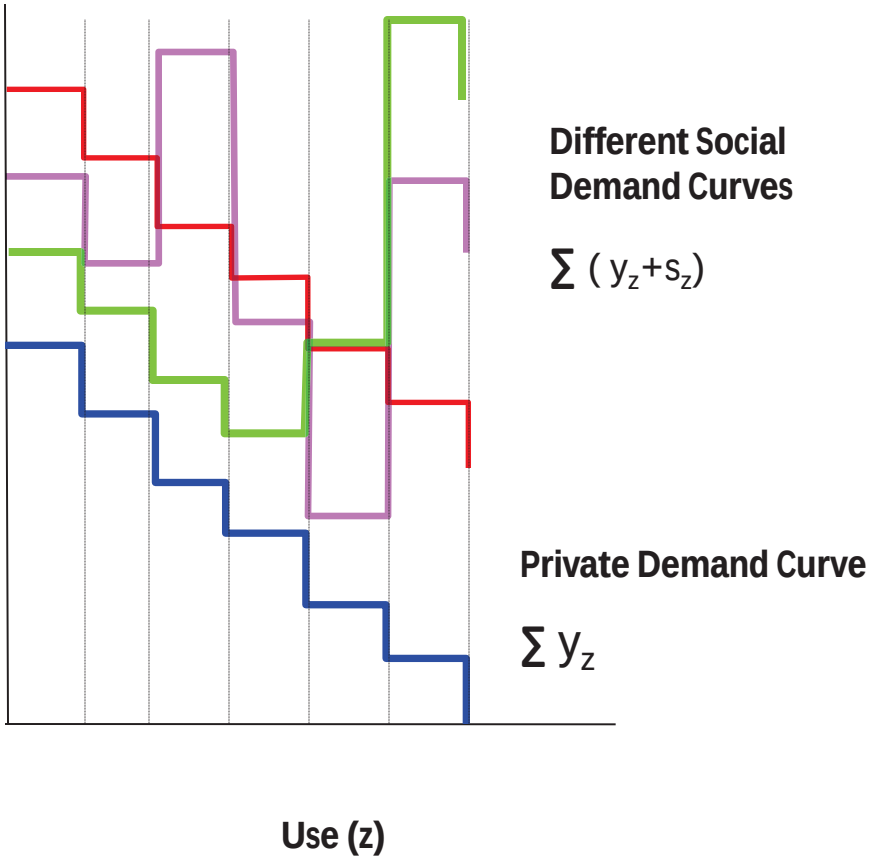
Intended audience? 1? M

***Ex ante*, neither market nor government will efficiently select or support either type.**

Open infrastructure, however, supports basic user capability.

Why does this matter?





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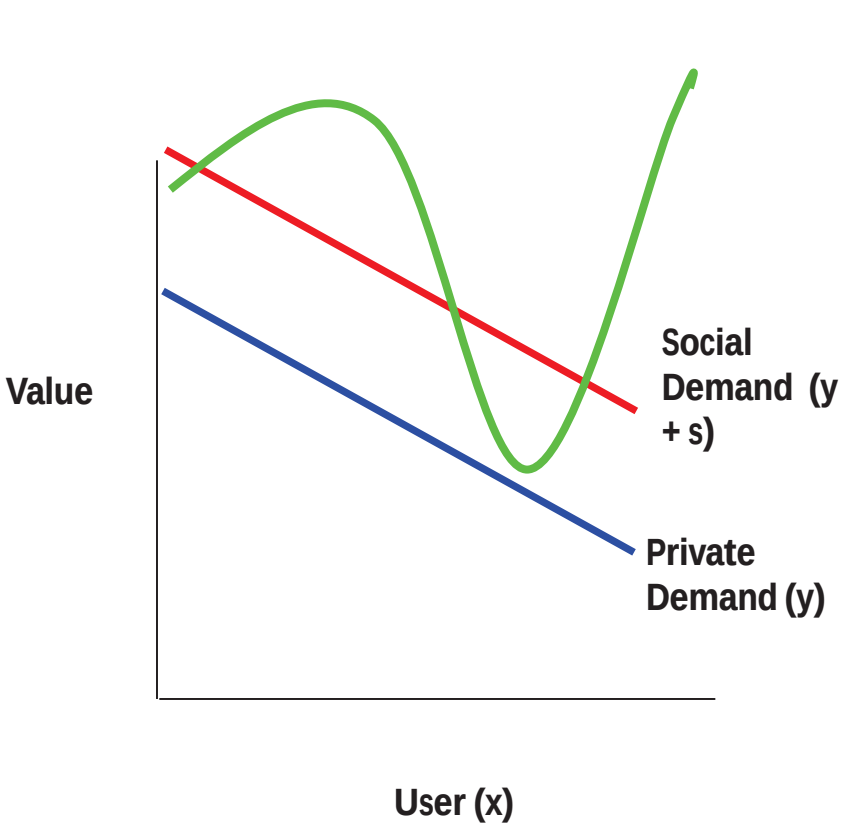
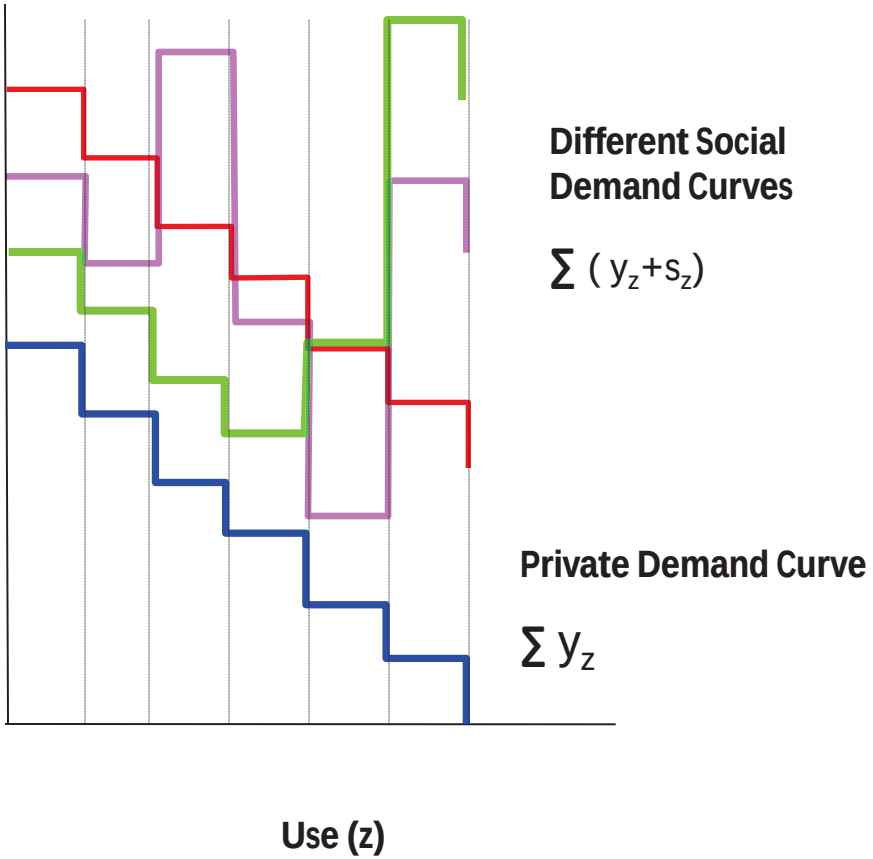
Market failures (from relying on blue curves)

- Undersupply of infrastructure
- Undersupply of infrastructure-dependent public and social goods
- Misoptimization of infrastructure
- Market bias / Optimization for
  - Applications/uses that generate observable and appropriable value (rather than spillovers)
  - Known or expected applications/uses

Why does this matter?





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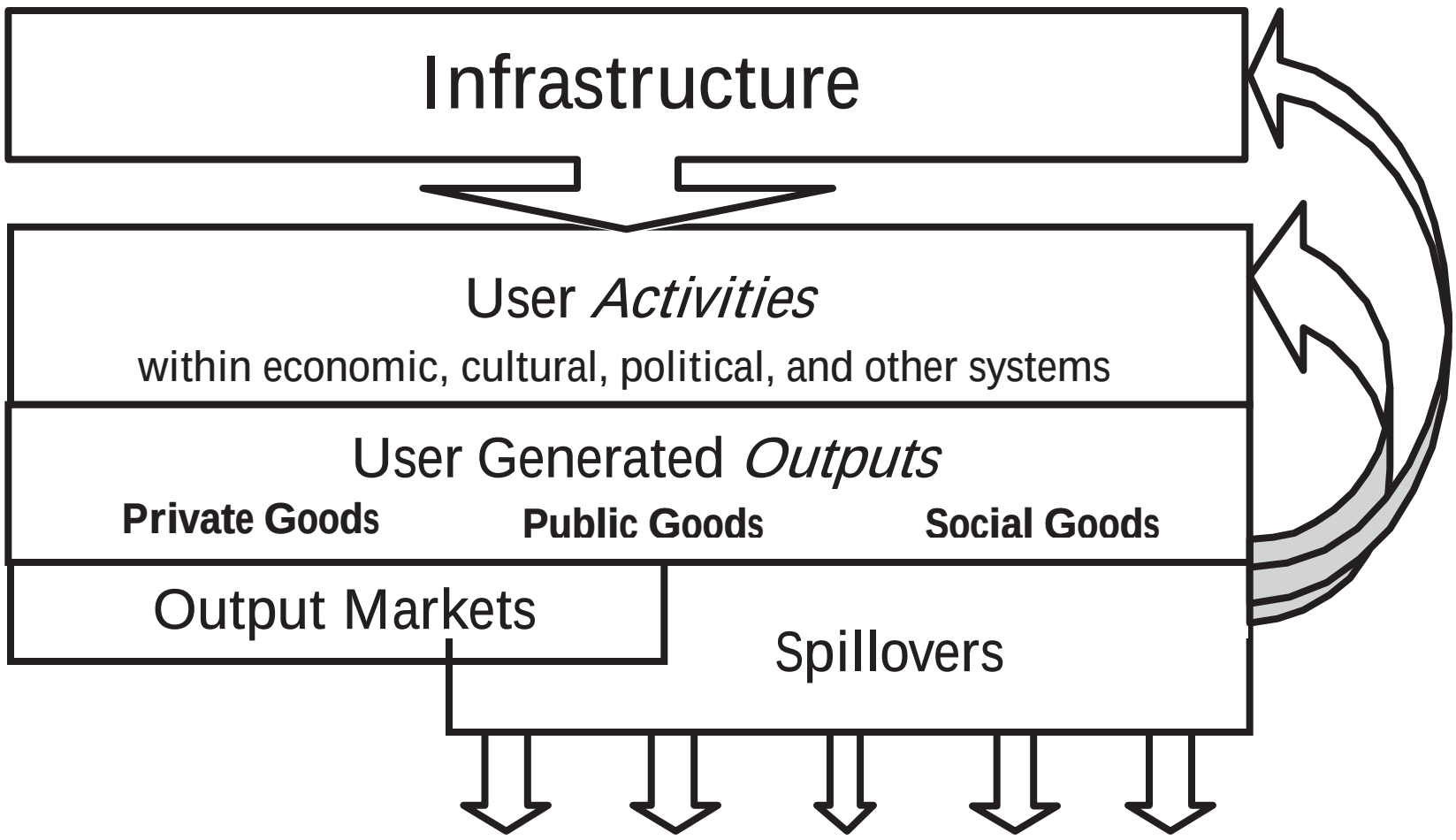
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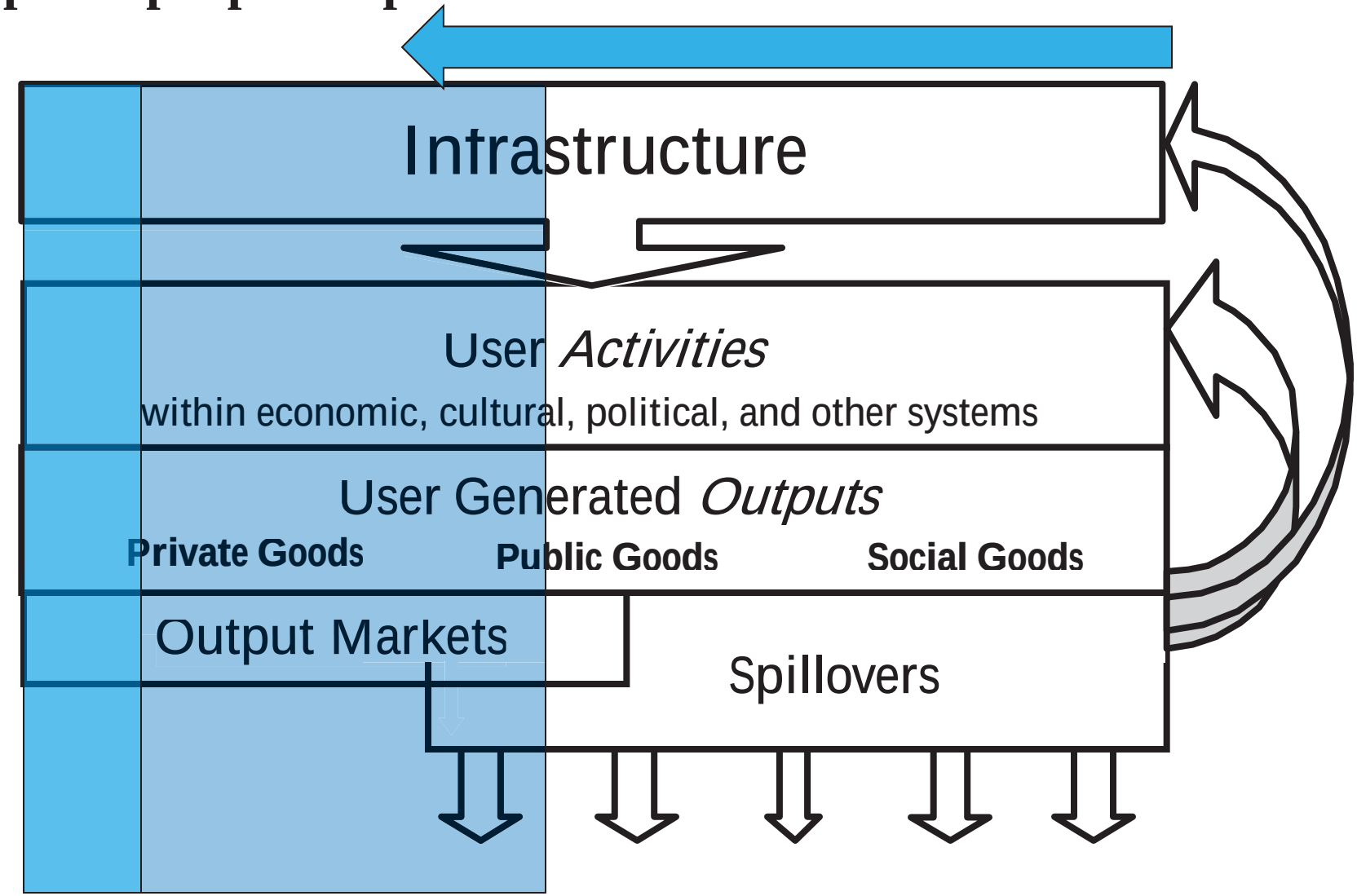
Special purpose input? Commercial infrastructure?



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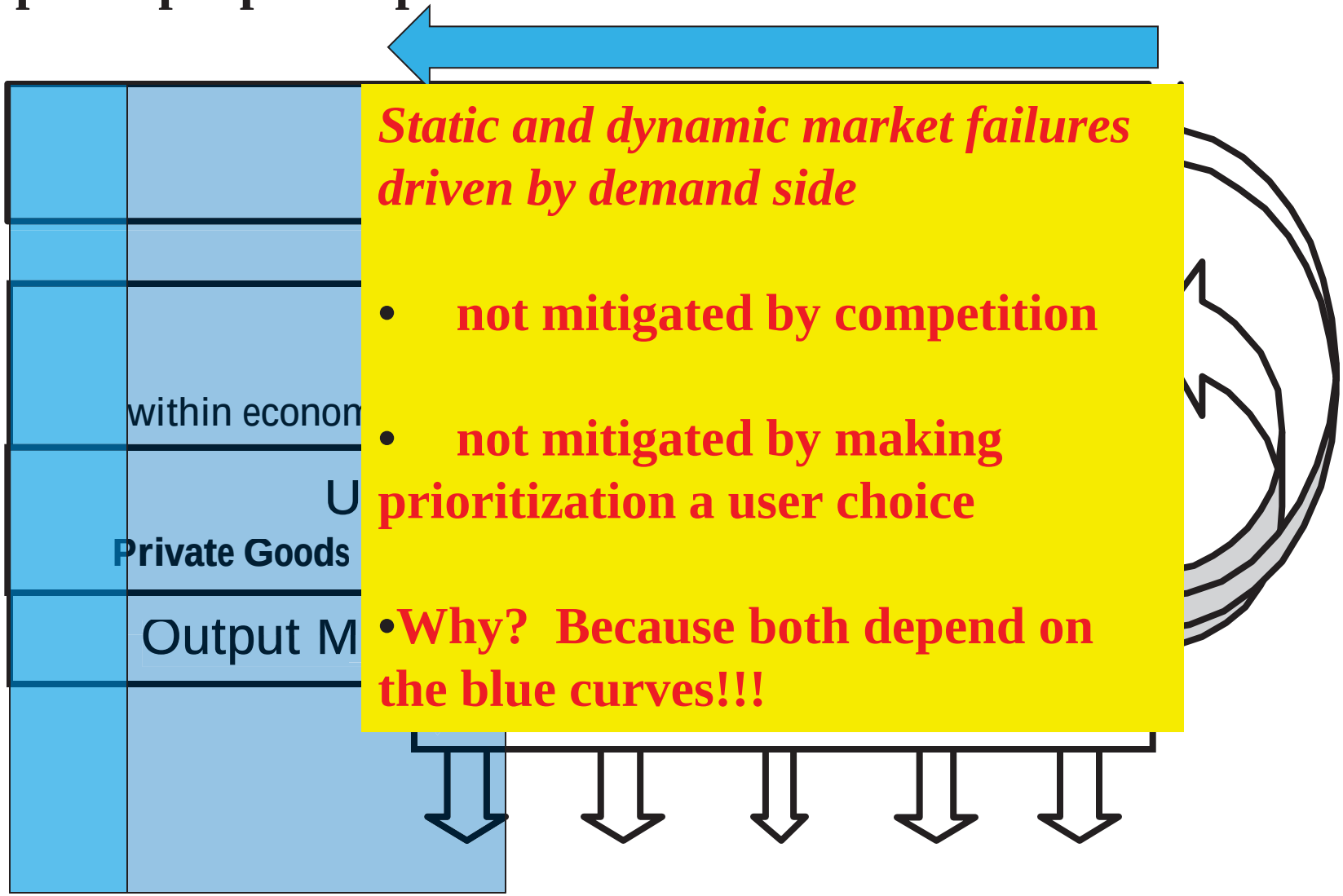
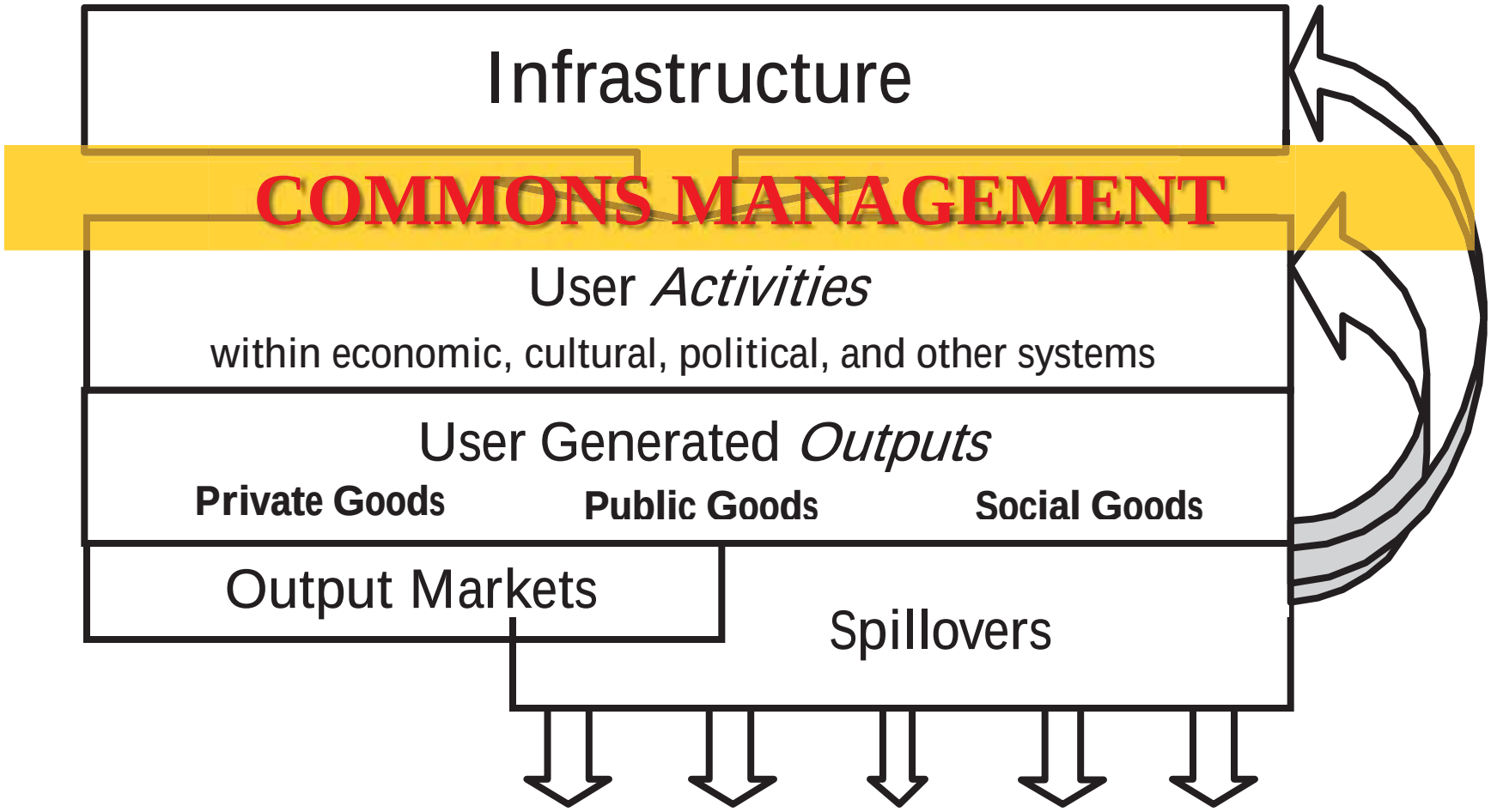


Static and dynamic market failures driven by demand side

- **not mitigated by competition**
- **not mitigated by making prioritization a user choice**
- **Why? Because both depend on the blue curves!!!**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- Commons alleviates the need to rely on either the market mechanism or the government to "pick winners"
  - Market allocates access to infrastructure based on appropriability of returns from outputs
    - *Market failures w/r/t public and social goods*
  - Could rely on the government to figure out which public good or social good outputs are worthy of subsidization or special treatment
    - *Government failures* w/r/t *with public and social goods*

Option Theory

- Option theory
  - When to optimize or specialize?
  - When to wait and see?

- Social option
  - High uncertainty regarding which users or uses will generate social value

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COMMONS MANAGEMENT

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Chapter 13: Network Neutrality

A. Internet Infrastructure and Commons Management through End-to-End Design

B. The Network Neutrality Debate

1. Network “Neutrality”
2. The Role of Antitrust and Regulatory Economics
    a. The Supply-Chain View of the Internet
    b. The False Supplier/Consumer Dichotomy
    c. The Competition Red Herring
3. Innovation

C. Reframing the Debate

1. The Internet as Mixed Infrastructure
2. Commons Management

D. A Proposed Nondiscrimination Rule and Various Complications

1. Proposed Rule
2. Managing Congestion
3. Managing Unlawful, Hazardous, or Otherwise Harmful Traffic

Internet

- What makes the Internet valuable to society?

Layer	Description	Examples
Social	Relations and social ties among users	Social networks, affiliations, groups
Content	Information/data conveyed to end-users	E-mail communication, music, web page
Applications	Programs and functions used by end-users	E-mail program, media player, web browser
Logical Infrastructure	Standards and protocols that facilitate transmission of data across physical networks	TCP/IP, domain name system
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Five-Layer Model of the Internet

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e2e architecture: voluntary adoption of standards by various networks (physical infrastructure providers)

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e2e architecture: voluntary adoption of standards

Leads to what Barbara van Schewick calls application blindness!

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e2e architecture: voluntary adoption of standards

Or what I call an infrastructure commons!

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e2e architecture: voluntary adoption of standards

Technologies and business practices that enable cheap defection

Infrastructure commons under threat!

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Why? By whom?

money, power, politics

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Suppose you have a problem at this layer?

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Infrastructure commons under threat!

- ***Why? By whom?***
- ***Discuss: money, power, politics***

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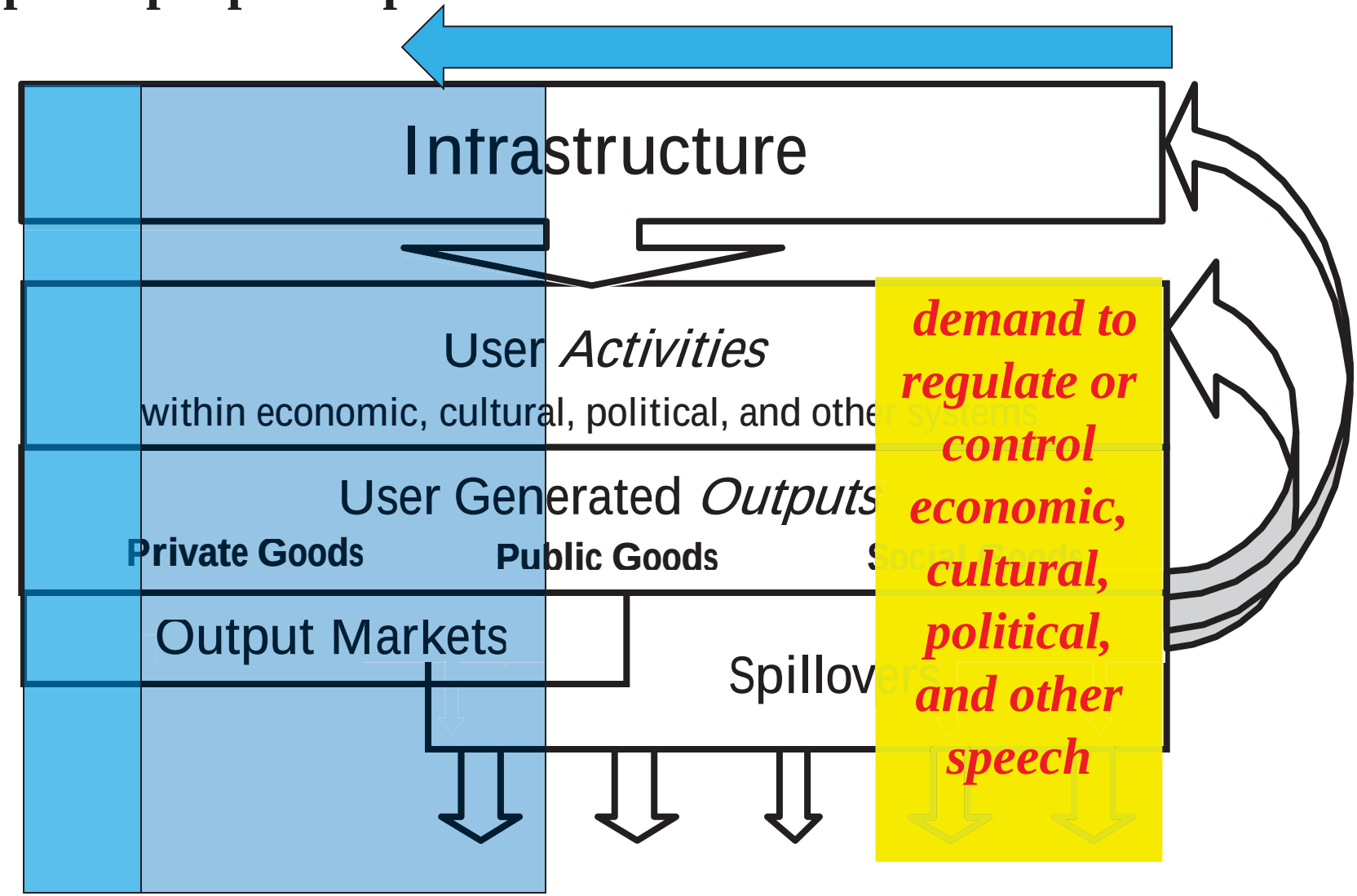

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FCC Open Internet Order (2010)

- Wired broadband
- Wireless broadband *

Transparency

No blocking (for wireless, only lawful websites, applications that compete with voice or video)

No unreasonable discrimination (doesn't apply to wireless)

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***Verizon v. FCC* (DC Cir. 2014)**

Court of Appeals decision struck down key provisions of OIO

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   a. The Supply-Chain View of the Internet
   b. The False Supplier/Consumer Dichotomy
   c. The Competition Red Herring
3. Innovation

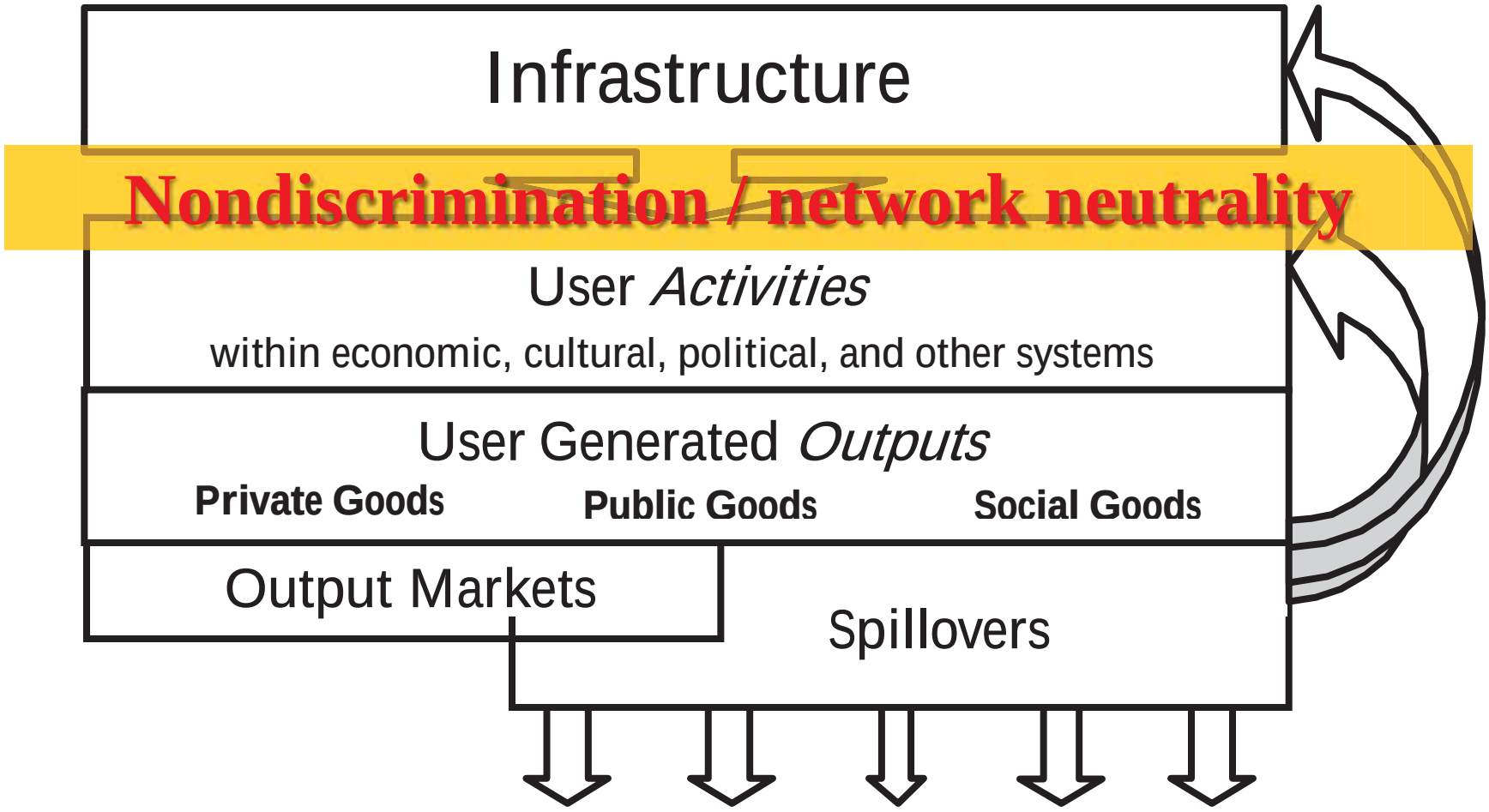
1. Myopic focus on antitrust and regulatory economics misses forest for the trees.

   – The Internet is not merely a supply chain

   – Google and I are both users.

   – Even if we assume competitive markets – a heroic assumption – the case for network neutrality regulation remains quite strong

2. Proposed rule:
   - FCC should prohibit broadband Internet access service providers from discriminating based on the *identity* of the *user or use* in the handling of packets.
   - Under this approach, user may be defined as sender or receiver; use may be defined as application or content type; handling may be defined as all transport and related services associated with delivery of packets.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